



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,893	12/16/2003	Shuji Nagano	0649-1153PUS1	3545
2292 7590 03/30/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER ESHETE, ZELALEM	
			ART UNIT	PAPER NUMBER
			3748	
SHORTENED STATUTORY PERIOD OF RESPONSE		NOTIFICATION DATE	DELIVERY MODE	
3 MONTHS		03/30/2007	ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/30/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com /

<b>Office Action Summary</b>	<b>Application No.</b> 10/735,893	<b>Applicant(s)</b> NAGANO ET AL.	
	<b>Examiner</b> Zelalem Eshete	<b>Art Unit</b> 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/21/07</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

This Office action is in response to the amendment filed on 2/9/2007

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5,8,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanshin (JP2001336407) in view of Voll (4,713,704).

Regarding claims 1,8,9: Sanshin discloses a valve system for an internal combustion engine (see figure 2), comprising: an intake-side rocker shaft having a first oil channel extending in a longitudinal direction thereof (see numeral 33); an exhaust-side rocker shaft having a second oil channel extending in a longitudinal direction thereof (see numeral 34); intake-side rocker arms having ends thereof connected to intake valves and supported on said intake-side rocker shaft such that said intake-side rocker arms rock (see numerals 31a,31b,31c), the intake-side rocker arms being driven by an intake cam (see numerals 30a,30b,30c); and exhaust-side rocker arms having ends thereof connected to exhaust valves and supported on said exhaust-side rocker shaft such that said exhaust-side rocker arms rock (see figures 4,5), the exhaust-side

Art Unit: 3748

rocker arms being driven by an exhaust cam (see numeral 30d); switching mechanism switching operating characteristics of the intake/exhaust valve (see abstract).

Sanshin fails to disclose the intake/exhaust side rocker shaft that is provided with the switching mechanism has a larger diameter than the exhaust/intake side rocker shaft.

However, Voll teaches that shaft which requires a higher stiffness has a larger diameter (see column 4, lines 29 to 34).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sanshin's device by providing larger diameter for the one provided with the switching mechanism or has higher load and thus requiring greater stiffness as taught by Voll based on the stiffness requirements as taught by Voll in order to reduce unnecessary engine weight through such optimization.

Regarding claim 2: Sanshin discloses the claimed invention as recited above and further discloses said intake-side rocker arms includes, a first rocker arm having an end thereof connected to the intake valve and supported on said intake-side rocker shaft such that said first rocker arm rocks (see numeral 31a), the first rocker arm being driven by a first low-lift cam (see numeral 30a), a second rocker arm having an end thereof connectable to said first rocker arm and supported on said intake-side rocker shaft such that said second rocker arm rocks (see numeral 31b), the second rocker arm being driven by a high-lift cam causing a larger valve lift than the first low-lift cam (see

Art Unit: 3748

numeral 30b), and a connection switching mechanism that selectively connects or disconnects said second rocker arm to or from said first rocker arm (see abstract).

Regarding claim 3: Sanshin discloses the claimed invention as recited above; and further discloses said intake valves includes a first intake valve and a second intake valve (see figure 4; numeral 25), and said intake-side rocker arms includes a first rocker arm having an end thereof connected to said first intake valve and supported on said intake-side rocker shaft such that said first rocker arm rocks (see numeral 31c), the first rocker arm being driven by a first low-lift cam (see numeral 30c), a third rocker arm having an end thereof connected said second intake valve and supported on said intake-side rocker shaft such that said third rocker arm rocks (see numeral 31a), the third rocker arm being driven by a second low-lift cam that causes a smaller valve than the first low-lift cam (see numeral 30a), a second rocker arm having an end thereof connectable to said first rocker arm and supported on said intake-side rocker shaft such that said second rocker arm rocks (see numeral 31b), the second rocker arm being driven by a high lift cam that causes a larger valve lift than the first low lift cam (see numeral 30b), and a connection switching mechanism that selectively connects or disconnects said second rocker arm to or from said first rocker arm and said third rocker arm (see abstract).

Regarding claim 4: Sanshin discloses said intake side rocker arms includes center pivot type rocker arms with middle parts thereof pivoted by said intake said rocker shaft (see figure 5).

Regarding claim 5: Sanshin discloses said intake side rocker arms and said exhaust side rocker arms are driven by a single cam shaft disposed between said intake side rocker shaft and said exhaust side rocker shaft (see figures 4,5).

3. Claims 6,7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanshin in view of Voll as applied to claim 3; and further in view of Konno (5,553,584).

Sanshin discloses the claimed invention as recited above except for specifying the type of the roller.

However, Konno teaches the roller is a "double ring type" sliding roller or a roller provided with a needle bearing" as follower of the cam (see figure 34).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sanshin's device by providing the roller as taught by Konno in order to reduce friction during power transmission from the camshaft.

### ***Response to Arguments***

4. Applicant's arguments filed 102/09/2007 have been fully considered but they are not persuasive.

Art Unit: 3748

5. In response to applicant's arguments on pages 1,2: The primary reference discloses the claimed invention except for failing to disclose a rocker shaft of greater diameter for the one provided with the switching element. The secondary reference teaches that shaft which requires a higher stiffness has a larger diameter (see column 4, lines 29 to 34).

6. The presence of a switching device is the more reason why one of ordinary skill in the art would be motivated to provide the one with a switching device with a greater diameter. That is because the switching mechanism induces greater loading as the mechanism shifts from low cam to high cam profile for example. This in turn justifies providing greater diameter for the shaft that requires greater stiffness, or additional loading required due to the switching mechanism.

7. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to assign greater diameter to the rocker shaft that is provided with the switching mechanism based on the one that demands greater stiffness be it intake rocker shaft or exhaust rocker shaft.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

Art Unit: 3748


mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zelalem Eshete whose telephone number is (571) 272-4860. The examiner can normally be reached on Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zelalem Eshete  
Examiner  
Art Unit 3748

  
THOMAS DENION  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700

